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CHANGE OF MANAGEMENT

REQUIRED FOR THE

United States Naval Observatory.

(January, 1892.)

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[Extract from the Report of the Secretary of the Navy for 1891.]

"Naval Observatory.

"The work on the new Naval Observatory has advanced so far that the transfer from the old to the new site will shortly be undertaken. The failure of the contractors has delayed the work of the new building, now in its final stage, but the Government is amply protected, and arrangements are now making under the provisions of the contract by which its early completion may be assured.

"When the transfer and installation of the instruments are completed, the Government will be in possession of one of the most admirably equipped observatories in the world. The question of the proper administration of this important charge, representing one of the most important branches of scientific investigation undertaken by the Government, is one that demands early attention. The system in existence hitherto, by which the selection of the Superintendent has been confined to line officers of the Navy, subject like other officers to changes of duty at comparatively short intervals, prevents that continuity of administration which is essential in carrying on the work of a great national observatory. No programme of scientific investigation, especially in the department of astronomy, can be carried out successfully by any institution, if liable to frequent interruptions by a change of its administrative head.

"I therefore recommend the adoption of legislation which shall enable the President to appoint, at a sufficient salary, without restriction, from persons either within or outside of the naval service, the ablest and most accomplished astronomer who can be found for the position of Superintendent.

"I would also recommend, in view of the era of progress and scientific development upon which the Observatory is now entering, that an advisory council be organized, composed of the Superintendent of the Observatory and its senior professor, and of three other persons of scientific attainments, whose duty it shall be to consider and report upon new instruments and their proper installation; to draw up, with such changes as may be necessary, from time to time, the programme of scientific work, including observation, reduction, and publication, and to make such inspections and reports as may be desirable in regard to the character of the work done by the Observatory."

A MEMORIAL

— FROM —

PRACTICAL ASTRONOMERS.

To the Congress of the United States:

Your petitioners respectfully call attention to the question of the future administration of the New Naval Observatory—brought to official notice by the Honorable Secretary of the Navy in his current annual report—as one entitled to your careful consideration. The buildings for this establishment are now being completed on a scale and at an expense which, we believe, have never been equaled in the case of any national institution devoted to celestial research. The magnitude of the appropriations made by four successive Congresses for this purpose clearly expresses the popular will that the Astronomical Observatory of the nation should be second to none in the value and interest of its work.

We, therefore, respectfully set forth the fact that buildings and instruments are not the chief conditions of success. A well considered plan of work, pursued with zeal under competent scientific direction, is absolutely essential. A body of the ablest astronomers, thrown together without adequate guidance, without any problem to solve, and without a concerted plan of work, can no more achieve success than an army can march and fight without a general. All experience shows that the success or failure of a scientific as of a business institution depends upon its directing head.

By the labors of many generations of investigators, astronomy has now become a science of such extent that those only who make its cultivation the principal business of their lives

can keep pace with its progress, and decide how the energies of a corps of astronomers should be directed.

The proper administration of the Observatory now being completed, therefore, requires that its direction be placed in the hands of a practical astronomer, and we respectfully ask for such legislation as will secure this end.

B. A. Gould [N. A. S.],
Editor of the Astronomical Journal,
Cambridge, Mass.

Edw. Pickering [N. A. S.], *Director*,
Harvard College Observatory,
Cambridge, Mass.

H. A. Newton [N. A. S.], *Secretary*,
Board of Managers of the Observatory,
Yale University, Conn.

Truman Henry Safford, *Director*,
Williams College Observatory,
Williamstown, Mass.

J. G. Porter, *Director*,
Cincinnati Observatory,
Cincinnati, Ohio.

George C. Comstock, *Director*,
Washburn Observatory,
Madison, Wis.

George M. Searle, *Director*,
Observatory of the Cath. University,
Washington, D. C.

H. S. Pritchett, *Director*,
Observatory of Washington University,
St. Louis, Missouri.

W. L. Elkin, *Astronomer*,
Observatory of Yale University,
New Haven, Conn.

Winslow Upton, *Director*,
Ladd Observatory,
Providence, R. I.

David P. Todd, *Director*,
Amherst College Observatory,
Amherst, Mass.

William A. Rogers [N. A. S.],
Professor of Physics and Astronomy,
Colby University, Maine.

C. A. Young [N. A. S.], *Director*,
Halstead Observatory,
Princeton, N. J.

Edw. S. Holden [N. A. S.], *Director*,
Lick Observatory,
California.

Ormond Stone, *Director*,
Leander McCormick Observatory,
University of Virginia.

Mary W. Whitney, *Director*,
Vassar College Observatory,
Poughkeepsie, N. Y.

James E. Keeler, *Director*,
Allegheny Observatory,
Allegheny, Penn.

G. W. Hough, *Director*,
Dearborn Observatory,
North-Western University, Ill.

John K. Rees, *Director*,
Observatory of Columbia College,
New York City.

Herbert A. Howe, *Director*,
Chamberlain Observatory,
University of Denver, Colo.

F. P. Leavenworth, *Director*,
Observatory of the College,
Haverford, Penn.

Lewis Swift, *Director*,
Warner Observatory,
Rochester, N. Y.

C. L. Doolittle, *Director*,
Sayre Observatory, Lehigh University,
South Bethlehem, Penn.

Seth C. Chandler [N. A. S.],
Private Observatory,
Cambridge, Mass.

DANIEL KIRKWOOD, *Astronomer*,
Leland Stanford, Jr., University,
Riverside, California.

C. W. PRITCHETT, *Director*,
Morrison Observatory,
Glasgow, Mo.

WILLIAM W. PAYNE, *Director*,
Goodsell Observatory, Carleton College,
Northfield, Minn.

HENRY M. PARKHURST, *Astronomer*,
Private Observatory,
Brooklyn, N. Y.

JOHN N. STOCKWELL,
Astronomer,
Cleveland, Ohio.

MILTON UPDEGRAFF, *Director*,
Observatory of State University,
Columbia, Missouri.

LEWIS BOSS [N. A. S.], *Director*,
Dudley Observatory,
Albany, N. Y.

ARTHUR SEARLE,
Phillips' Professor of Astronomy,
M. FLEMING,
O. C. WENDELL,
WILLARD P. GERRISH,
J. RAYNER EDMANDS,
} Astronomers of the Harvard College Observatory, Cambridge, Mass.

S. W. BURNHAM,
J. M. SCHAEBERLE,
E. E. BARNARD,
W. W. CAMPBELL,
HENRY CREW,
} Astronomers of the Lick Observatory, California.

Members of the National Academy of Sciences are indicated thus: [N. A. S.].

The petition to Congress—a copy of which precedes—is signed only by practical working astronomers, not in employ of the Government. Among the signatures are those of well-known astronomers employed in the two chief observatories of the United States; otherwise, the list of signers is composed of those who direct their own labors in astronomical research, either as directors or owners of working observatories, or in a similar independent capacity. In addition to these, there is a very large number of persons identified with, or directly interested in, astronomical work, as well as an army of the friends of astronomy, whose names are not represented here. The still greater multitude of those who, though not astronomers, are interested in maintaining the intellectual dignity of the nation in the scientific work which it undertakes, is also not here represented. It remains for the future to determine in what way shall be found an effective expression of the sentiments which prominent representatives of these interests are known to entertain.

REASONS WHY THE DIRECTOR OF THE NAVAL OBSERVATORY SHOULD BE A PRACTICAL ASTRONOMER.

The Naval Observatory at Washington is an astronomical institution supported by the Government of the United States. It was organized under an act of Congress, approved, August 31, 1842, "to authorize the construction of a depot of charts and instruments of the Navy." This establishment is attached to the Navy Department, and is under the superintendence of a line officer of the Navy. Its duties are performed by assistants of three classes. 1. Officers of the Navy usually attend to the rating of chronometers and to similar duties. 2. So far as the Observatory is concerned, members of the corps of Professors of Mathematics, U. S. N., are astronomers selected to take the most responsible part in its scientific work. 3. Astronomers and others are employed in a civilian capacity.

In the words of its Superintendent in 1885, this establishment, "from its humble beginning in 1838, has grown to be one of the most important astronomical centers in the world." If expenditure of money and resources is any criterion, this opinion is fully justified. Excluding the salary of its Superintendent and of line officers of the Navy in the service of the Observatory, the Government has devoted an average of nearly $41,000 annually to the current maintenance of the Naval Observatory during the past twenty-five years. Including the salaries of line officers, this annual average is swelled to nearly $56,000. About twenty years ago, Congress appropriated $67,000 for a great telescope and its accessories. More than $600,000 has recently been appropriated for the construction of the new Observatory. These facts prove that the Naval Observatory is one of the most liberally supported astronomical observatories in the world.

Naval or Marine observatories have been established by various governments—France, Germany, Austria, Russia and Italy among the number. These are invariably small establishments designed to serve the practical uses of naval and commercial interests. They rate chronometers, test nautical instruments and distribute charts, but do not un-

dertake astronomical investigations. In the latter respect the United States Naval Observatory differs, totally, from all other naval observatories in the world.

From 1830 to 1844 our Government had a naval observatory—the old depot of charts on Capitol Hill in Washington. This was the forerunner of the present Naval Observatory. Lieutenant Gilliss, who had been superintendent of the old depot and who was the most competent and hard-working astronomer our Navy has produced, explains what is needed in a mere naval observatory, and what was really intended in the present Naval Observatory, founded very largely through his personal efforts. In his well-known report of 1845 to the Secretary of the Navy, he says:

"In the mere store rooms for the charts and instruments, or depot, as it is called, I feel no anxiety. The house on Capitol Hill would have answered quite as well as any other, and a three and a half feet transit, in a box ten feet square, would have served to obtain the time for the comparing clock. These, therefore, possessed no attractions for me, and I should have regarded it as time misspent to labor so earnestly, only to establish a depot. My aim was higher. It was to place an institution under the management of *naval officers*, where, in the practical pursuit of the highest known branch of science, they would compel an acknowledgment of abilities hitherto withheld from the service."

The chief energies of the Naval Observatory have been devoted to astronomical research. Any one may easily verify this statement by reference to any one of the annual volumes published by the Observatory. Their pages are monopolized by theoretical researches, and by the reports of observations upon celestial objects which can only be observed with the powerful telescopes of fixed observatories on land. Not one in a hundred of these celestial objects to which the Observatory devotes its scrutiny can be practically observed by the mariner at sea, and a large proportion of them cannot even be seen by him. In its aims, and in the general nature of that which it undertakes, the Naval Observatory differs in no essential respect from national observatories in other countries.

Hence, the question, whether the Naval Observatory ought to be placed under the direction of a trained astronomer, becomes the question, whether the director of a national astronomical observatory should be a practical astronomer of great experience.

"It has been mooted," wrote Rear Admiral John Rodgers, Superintendent of the Naval Observatory in 1877, "whether the Observatory could be advantageously changed in location and organization, by putting it under a scientific head." In 1885, a Committee of the National Academy of Sciences, appointed to act upon a request from the Honorable Secretary of the Navy for an opinion in regard to the proposed construction of a new observatory, among other things, reported:

"It is advisable that the observatory so erected shall be, and shall be styled, as the present Observatory was styled originally, the National Observatory of the United States, and that it shall be under civilian administration."

In his annual report for 1891, the Honorable Secretary of the Navy, after a brief statement of reasons, proceeds as follows:

"I therefore recommend the adoption of legislation which shall enable the President to appoint, at a sufficient salary, without restriction, from persons either within or outside of the naval service, the ablest and most accomplished astronomer who can be found for the position of Superintendent."

These are the chief official indications of the progress of a movement for reform in the administration of the Naval Observatory. This movement has been, for a long time, a matter of deep concern with the friends of astronomy and with those who are anxious for the good reputation of the Government in the prosecution of those branches of that science which it actually undertakes. Progress has been slow because the questions involved are technical in their bearings and are not easily grasped by the public at large. The construction of a new observatory on a grand scale in response to many urgent appeals from the management of the Naval Observatory in respect to the necessity for enlarging its purely astronomical scope and facilities, more than ever, forces the question of its proper organization to immediate consideration.

Objection may be made that the Government will not and cannot support astronomical investigations. The answer is, that it has done so for the last fifty years and is doing so to-day. From near the beginning of the century, the public documents contain a long series of opinions by a president, heads of executive departments, and by committees of Congress, favorable to the support of astronomy by our Government, in the manner in which it is supported by other governments. The same idea has prevailed in practical administration. In 1846 the Honorable Secretary of the Navy addressed an order to the Superintendent of the Naval Observatory, in which he says: "The country expects, also, that the Observatory will make adequate contributions to Astronomical Science." Congress has provided generously for expeditions to observe eclipses of the Sun and transits of Venus. The liberality of our Government in this respect has probably been greater than that of any other. The great twenty-six inch telescope of the Naval Observatory—which is of no use whatever, otherwise than in pure astronomical research—is a monument in commemoration of the interest which our Government has taken in astronomy. Over and over again, Congress has appropriated money in response to direct appeals from the Observatory for the means to keep up its astronomical reputation. No more reckless waste could be imagined than that of the expenditures for the new Naval Observatory, if it is constructed solely for the purpose of rating

chronometers and testing nautical instruments. The constructions and equipment are evidently designed for scientific work — some of it practical and the larger part of it theoretical — but, all of it, work which requires the services of skilled astronomers to produce the intended result.

The astronomers of the country in their petition for reform in the organization of the Naval Observatory do not ask for a change in respect to the *kind* of work which it may undertake. They believe that technical work in astronomy should be managed by astronomers, whether that work be for purely scientific uses—as the greater part of the astronomical work which has been done at the Naval Observatory is—or whether it be for the equally scientific work of affording means for correcting tables in practical use by navigators. The work of making astronomical observations to facilitate the operations of geographical surveys and earth-measurement demands professional supervision for quite the same reason as observations of telescopic stars and planets require it. Because a skilled engineer of high scientific training and experience is appointed to superintend difficult engineering work, shall the objection be raised that the government which employs him is showing too much favor to science? Whatever astronomical work for theoretical or practical uses the Government chooses to undertake should be done in the most economical and workmanlike manner. That is all astronomers ask. They are thoroughly in accord with the practical experience of the world when they express the opinion that the best man to direct such work is the man who knows how to do it, how it ought to be done, and when it is properly done.

That the directing head of an astronomical observatory should be a trained astronomer seems to be a common-sense proposition to which the vast majority of people would probably assent without discussion. But are not naval officers, in virtue of their commissions, astronomers? The pursuit of practical astronomy has always been a profession, requiring fully as much preparatory study and practice as any other learned profession demands. This is so now, more than ever before. There is nothing in the course of instruction at the Naval Academy which is specially designed to educate astronomers. The committee of the National Academy in its report of 1885, pertinently and truly says:

"There is already an observatory at Annapolis, but the course of instruction pursued at the naval school there, is of itself evidence how little importance is considered in naval education to attach to the processes of practical astronomy as conducted in fixed observatories. All the astronomical training which the naval cadets receive is confined to the principles of navigation and the use of portable reflecting instruments. It is believed that the observatory of the academy is not used at all, and has not been for many years, and the neglect of it would appear to show that the naval officers stationed there have not the time

to occupy themselves with subjects so far outside the necessities of their professional life."

The entire history of the Naval Observatory proves that naval line officers have not the time and opportunity to become competent practical astronomers. On this point, the late Admiral Rodgers, a former Superintendent of the Observatory, summing up his experience, in 1877, says:

"No corps in which observatory work is casual, to be abandoned upon occasion for the proper duties of another profession, can compete with the observatories of Europe, in which astronomical observations are a life-long pursuit."

Naval officers cannot become accomplished astronomers without sacrificing their professional training as seamen and soldiers. It is said that Captain Gilliss, Superintendent of the Observatory from 1861 to 1864, was placed upon the retired list, on the ground that his continued devotion to astronomical pursuits had unfitted him for active duty in the Navy.

Still less can a naval officer hope to acquire that broad experience in astronomical science and that intimate acquaintance with its professional literature, which is absolutely necessary to fit a man for directing the labors of other astronomers in a great observatory. The success of a national observatory depends upon its director more than it does upon anything else. This is the experience of the world; and, for that reason, the selection of an astronomer to direct the labors of such an institution (no matter how practical its duties) has always been a matter for the most careful deliberation. To mention only a few, the names of Flamsteed, Halley, Bradley and Airy, directors of the English Royal Observatory; of the Cassinis, Arago and Leverrier, directors of the French observatory; of Encke, director of Berlin observatory; and of Wilhelm and Otto Struve, directors of the Russian observatory, are among the most distinguished in the annals of astronomy.

What are the practical duties of the director of astronomical work on a large scale? What duties are actually performed by the directors of large national observatories in other countries? These two questions can be answered as one.

Out of a multitude of pressing claims, the director must select the work to be undertaken by the observatory under his charge. This choice must be made, because no one observatory can do more than a small share of the world's work in astronomy. The present is a time of extraordinary development in astronomical science,—both in its theoretical and practical phases. The recognition of this fact has led to the construction of many new observatories on a grand scale during the past ten or fifteen years. The number of these is nearly equal to the total of those of similar rank which had previously existed. Astronomy

no longer moves on in a rut. None but an experienced astronomer is able to decide upon the fields which the observatory under his charge must strive to conquer. One of his most difficult and responsible duties in this connection is to choose, or devise, the equipment of instruments, with the greatest possible economy.

When the work is chosen the director must see that it is executed in a faithful and workmanlike manner. He must be able to judge of the special professional abilities of the assistants placed under his direction, in order to make wise assignments to duty. He must follow up work by personal inspection during its progress, to see, before it is too late, that the standard of excellence required is likely to be attained. It is his duty to exercise a *de facto* editorial supervision upon the publications of the observatory.

Those interested in perpetuating the control of the Observatory by line officers of the Navy have seriously advocated the strange proposition that these and other responsible duties of the director of an astronomical observatory should be subordinated to the routine duties of business management. What would be thought of the head of any Government bureau—even though that bureau might employ ten times as many persons as the Observatory does—if he should maintain that the responsible work of his office ought to be delegated to subordinates on the ground that his own time must be entirely absorbed in maintaining the discipline of the office, in the care of buildings, grounds and furniture, in looking after the pay rolls and other office expenditures, in superintending the tasks of laborers, and in other like duties? Notwithstanding the experience of those countries which maintain great national observatories under the management of astronomers, it has been intimated that business and administrative management ought not to be entrusted to mere astronomers,—or, in other words, to American astronomers. Yet, if it were needed, a most conclusive refutation of this grotesque hypothesis can be found in the successful management of large astronomical interests by American astronomers. If, through unfortunate arrangements and traditions, the management of the business affairs of the Naval Observatory has become so complicated as to demand the entire attention of one person, that person should be a subordinate.

The principles which make it necessary that an experienced lawyer should preside over a high court of justice, or that only a skilled musician of broad acquirements should be the conductor of a great orchestra, also prescribe that only a trained astronomer of ripe experience is fitted to preside over the work of a large astronomical observatory.

In nearly every country which has a large observatory it has been deemed expedient to appoint an advisory council or "board of visitors," composed of competent scientific men, to advise with the director in re-

spect to his more responsible scientific duties. The important function of such a board is to consider reports and to represent the public interests. It must judge whether the observatory is efficiently doing the work most appropriate to it and attending to public demands.

In this connection the Honorable Secretary of the Navy in his current annual report says:

"I would also recommend, in view of the era of progress and scientific development upon which the Observatory is now entering, that an advisory council be organized, composed of the Superintendent of the Observatory and its senior professor, and of three other persons of scientific attainments, whose duty it shall be to consider and report upon new instruments and their proper installation; to draw up, with such changes as may be necessary, from time to time, the programme of scientific work, including observation, reduction, and publication, and to make such inspections and reports as may be desirable in regard to the character of the work done by the Observatory."

The appointment of such a board was some time ago recommended by a Superintendent of the Observatory. While an advisory council of this description is a most desirable auxiliary, when the director himself is a man of high astronomical attainments, it is practically useless otherwise. It cannot perform the duties of a director. It may render valuable opinions; it may criticise with profit; but it rarely originates, and cannot carry plans into execution. The burden of the day must and will be borne by the man who has the direct responsibility.

In point of fact, however, has the Naval Observatory offered a practical demonstration of the proposition that men who are not astronomers can successfully manage a large astronomical observatory?

In an article in the North American Review for 1867, summing up the history of the Naval Observatory from 1844 to 1866, Professor Newcomb, then one of the chief assistants at the Observatory, said (editorially):

"Our judgment of the past work of the Naval Observatory may be summed up thus. That of the first four years, and of the last four years, so far as published, is highly creditable to the country, and to the Navy, all things considered. Among the things to be taken into account are the want of educated astronomers in the beginning and the inferior character of many of the instruments throughout the history of the observatory. During the intervening years [12 years] the operations are creditable to no one but the one or two astronomers by whom all the observations of value were made."

During the period from 1861 to 1867, the Naval Observatory was in charge of the only naval officers who could make any just claim to be considered practical astronomers; and one of these, as previously stated, was placed upon the retired list upon the ground that his absorption in astronomical work had unfitted him for active duty in the Navy. The available resources of the Observatory have been large. That institution has, therefore, been able to command the services of able astrono-

mers as assistants. Among these have been numbered some of the ablest practical astronomers which this country has known. The average ability of the astronomical staff at the Naval Observatory has ranked well. For all these reasons, it is not strange that good work has sometimes been produced at the Observatory, even under a most objectionable system. But the record on the whole is unsatisfactory. Much of the work has been wasteful of energy and undeniably bad. Much more has been relatively mediocre, and below the dignity of a great national institution. It is notable that the observations made in the interests of pure science, have generally been superior in quality, to those which have some practical relation to the needs of navigation and geodesy (or higher surveying and earth-measurement). There has been lack of organization in the scientific work; an almost total lack of coördination in the scientific activities of the astronomers; and very serious lack of judgment in the provision for instrumental equipment.

Usually the terms of service of the superintendents have been so brief, owing to the exigencies of naval service, that it would have been unfair to expect a high degree of efficiency in administration, even if the superintendents had all been astronomers of great experience. The inevitable result of this constant change in supervision, and of non-astronomical superintendence, is vividly portrayed in the annual report of the Superintendent for 1891. He says:

"The issuing of the annual volumes of the observatory has been for years falling farther and farther behind, until now publication is five years behind the observations, and the amount of work done has been growing less and less. Important improvements in instruments and in methods of observation, as well as new and equally important lines of research, many of which are actively pushed forward at the principal Government observatories, have here been entirely neglected on account of the lack of practical astronomers to make independent observations and to carry on special investigations in conjunction with other observatories."

Yet the total resources of the Observatory during this period of degeneracy have suffered no material diminution at any time, and of late years they have been decidedly increased. Either the system is a bad one, or the administration has been inefficient.

The truth is that the working staff of the Observatory has constituted an astronomical mob. The Observatory has had periods of energetic and successful work, even without the leadership of an astronomer. Mobs have taken possession of great cities against disciplined soldiery; but no nation would, for this reason, rely for its defense upon an army devoid of skilled organization and leadership.

We have recently entered upon a period of remarkable activity in astronomical research. Forty years ago astronomy seemed to have settled down to the task of perfecting the knowledge handed down from a

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previous generation. There appeared to be little expectation of radically improving the appliances and methods of research. The hope of opening fresh fields of investigation was either wanting or dormant. Now, all is changed. Observatories are full of eager life and expectation. We are rushing on to the other extreme. There is danger that the thirst for novelty will enfeeble the arm of more patient investigation. National observatories are maintained to accomplish the severe and prolonged tasks of astronomy from which smaller observatories and private enterprise are apt to shrink. Under a proper system of organization the life of the large national observatory is continuous. In reference to a particular thing which it undertakes the national observatory is not dependent upon the life of one man as the smaller observatory in private hands usually is. The national observatory recognizes an obligation to the public at large. It must furnish the material in observations and researches which are necessary in the interests of the public service and in the most important and comprehensive fields of astronomical investigation that are likely to be neglected, if left to private enterprise. But the national observatory should not necessarily plod on in the old ruts. It must look sharply for the most profitable investment for labor. In this time of remarkable development in astronomy, therefore, the task of the director of a great astronomical Observatory is more responsible and calls for a greater fund of astronomical knowledge and a larger breadth of professional experience than ever before.

There is a phase of this question as to the proper organization of the Naval Observatory which is related to the theory of government. It is concerned with the proper spheres of military and civil duties. In the first place, it is evident to the most casual student of human nature, that the temperament necessary to constitute a good soldier is widely different from that which leads to successful investigation in pure science. The soldier is a man of action; the astronomer is a student. Suppose, however, that naval officers have all the qualities necessary to make them competent astronomers; suppose, also, that the difficulty of successfully commingling the pursuits of two professions in the life of one person can be surmounted; there would still remain grave objections against employing naval officers in work so far removed from the proper duties of their profession. The tendency of our Government has been to recognize and act upon these objections. It has transferred the geographical and geological work formerly carried on by Army surveys in the West to a civilian bureau. More recently it has converted the Weather Bureau of the Army Signal Corps into a civilian organization. The Joint Commission of Congress appointed a few years ago to consider whether a better coördination of the work of scientific bureaus of Government is required, formulated in its report the underlying principle of objection against employing the military in scientific investigation.

This principle is succintly expressed in the minority report signed by Hon. John T. Morgan, Hon. Hilary A. Herbert, and Hon. John T. Tait. They say:

"As a question of proper civil administration, it seems clear to the commission, as appears in the general report, that it is not good government to put a branch of the service that has no necessary relation to military affairs under the regimen of a military establishment and under military organization and command."

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